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# Into the Wild Green Yonder: Applying the Clean Air Act to Regulate Emissions of Greenhouse Gases from Aircraft

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# Into the Wild Green Yonder: Applying the Clean Air Act to Regulate Emissions of Greenhouse Gases from Aircraft

## **Cover Page Footnote**

International Law; Commercial Law; Law

# **INTO THE WILD GREEN YONDER: APPLYING THE CLEAN AIR ACT TO REGULATE EMISSIONS OF GREENHOUSE GASES FROM AIRCRAFT**

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## **I. Introduction**

Despite the growing knowledge of and threat posed by climate change, the aviation industry continues to operate without any adaptation or mitigation efforts with respect to climate change.

The public health threats posed by climate change are well established in the scientific community, as is the certainty that this threat is caused by green house gas (GHG)<sup>1</sup> emissions attributable to humans.<sup>2</sup> While several countries and individual states in the United States have moved to address the problem,<sup>3</sup> the federal government has not only failed to act, but has intentionally delayed any possible action, going so far as refusing to open e-mails from the Environmental Protection Agency (EPA) that state GHGs represent an endangerment to public health.<sup>4</sup>

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<sup>1</sup> For the duration of this article GHGs will refer to carbon dioxide, methane, nitrous oxide and other synthetic gases (hydrofluorocarbons, perfluorocarbons and sulfur hexafluoride).

<sup>2</sup> INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE PLENARY XXVII, Valencia, Spain, Nov. 12-17, 2007, CLIMATE CHANGE 2007: A SYNTHESIS REPORT, AN ASSESSMENT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *available at* [http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4\\_syr.pdf](http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr.pdf) [hereinafter IPCC Report]. "Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice and rising global average sea level." *Id.* at 30; "Global atmospheric concentrations of CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O have increased markedly as a result of human activities since 1750 and now far exceed pre-industrial values determined from ice cores spanning many thousands of years (Figure 2.3). The atmospheric concentrations of CO<sub>2</sub> and CH<sub>4</sub> in 2005 exceed by far the natural range over the last 650,000 years. Global increases in CO<sub>2</sub> concentrations are due primarily to fossil fuel use, with land-use change providing another significant but smaller contribution. It is *very likely* that the observed increase in CH<sub>4</sub> concentration is predominantly due to agriculture and fossil fuel use. The increase in N<sub>2</sub>O concentration is primarily due to agriculture." *Id.* at 37. *See also* EPA, Climate Change Science, <http://www.epa.gov/climatechange/basicinfo.html>.

<sup>3</sup> *See* United Nations Framework Convention on Climate Change, Kyoto Protocol, [http://unfccc.int/kyoto\\_protocol/items/2830.php](http://unfccc.int/kyoto_protocol/items/2830.php) [hereinafter Kyoto]. The Kyoto Protocol is an international agreement made by thirty-seven industrialized countries to reduce their GHG emissions. The United States signed the treaty in 1997 but it has yet to be presented to Congress to be ratified and thus the U.S. is not an Annex B member country of the protocol. The protocol expires in 2012; there are currently meetings in Warsaw, Poland, of the United Nations Framework Convention on Climate Change and again next year in Copenhagen, Denmark, that are intended to establish a new agreement for post Kyoto Climate Change legislation. It remains to be seen if the U.S. will be a party to any such treaty or agreement. *Id.* *See also* PEW CENTER ON GLOBAL CLIMATE CHANGE, WHAT IS BEING DONE IN THE STATES – RENEWABLE PORTFOLIO STANDARDS, [http://www.pewclimate.org/what\\_s\\_being\\_done/in\\_the\\_states/rps.cfm](http://www.pewclimate.org/what_s_being_done/in_the_states/rps.cfm) (discussing the 27 States that have adopted Renewable Energy Portfolio Standards); *see also* PEW CENTER ON GLOBAL CLIMATE CHANGE, A LOOK AT EMISSIONS TARGETS, [http://www.pewclimate.org/what\\_s\\_being\\_done/targets](http://www.pewclimate.org/what_s_being_done/targets) (discussing the seventeen States that have adopted mandatory Carbon Reductions). Critics are split as to the effectiveness of State climate change mitigation policies. *See* Kevin Doran, *U.S. Sub-Federal Climate Change Initiatives: An Irrational Means to a Rational End?*, 26 VA. ENVTL. L.J. 181 (2007); *but see* Robert McKinstry, Remarks at the University of North Carolina Journal on International Law and Commercial Regulation Symposium: The Greenhouse Gas Marketplace: Commercial Regulation of Climate Change Solutions – "Integration of state and regional programs into a national program under the Clean Air Act" (Nov. 15, 2008).

<sup>4</sup> OMB WATCH, WHITE HOUSE CLIMATE CHANGE POLICY -- DELAY, DELETE, AND DENY, <http://www.ombwatch.org/node/3741>. *See also* Felicity Barringer, *White House Refused to Open Pollutants E-Mail*, N.Y. TIMES, June 25, 2008, *available at*

The lack of action by the federal government is troubling given that the United States accounts for 23% of worldwide carbon dioxide (CO<sub>2</sub>) emissions, the primary GHG contributing to climate change.<sup>5</sup> CO<sub>2</sub> represents 84% of GHG emissions in the United States.<sup>6</sup> Thirty-two percent of CO<sub>2</sub> emissions are attributed to the transportation sector, and 12% of the emissions from the transportation sector (or 3-4% of total CO<sub>2</sub>) are attributable to aviation.<sup>7</sup> The aviation industry is thus a significant contributor of GHGs in the atmosphere, but it receives relatively little attention compared to larger emitting industries such as light-duty motor vehicles or coal burning power plants, which are the source of 19% and 32% of total U.S. emissions, respectively.<sup>8</sup> Additionally, the aviation market is growing; it is estimated that aircraft emissions will triple by 2050.<sup>9</sup> Finally, there is some evidence that emissions released at higher altitudes may have a disproportionately increased effect on climate change when compared to emissions at lower altitudes.<sup>10</sup>

While aircraft emissions may seem small as a percentage of total GHG emissions, reductions in all sectors are necessary to truly address a threat as large as climate change. In November and December of 2007, states and environmental advocacy organizations respectively filed two separate petitions demanding that the EPA regulate the emission of GHGs from aircraft.<sup>11</sup> The

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<http://www.nytimes.com/2008/06/25/washington/25Sepa.html>.

<sup>5</sup> Robert R. Nordhaus, *New Wine into Old Bottles: The Feasibility of Greenhouse Gas Regulation under the Clean Air Act*, 15 N.Y.U. ENVTL. L.J. 53, 54-55 (2007).

<sup>6</sup> *Id.* at 54.

<sup>7</sup> EPA, INVENTORY OF U.S. GREENHOUSE GAS EMISSIONS AND SINKS: 1990 – 2005 (Apr. 15, 2007) at 3-9, *available at*

<http://www.epa.gov/climatechange/emissions/downloads06/07CR.pdf> [hereinafter EPA Inventory].

<sup>8</sup> *Id.*

<sup>9</sup> SIR NICHOLAS STERN, STERN REVIEW ON THE ECONOMICS OF CLIMATE CHANGE 172 (Cambridge Univ. Press) (Oct. 30, 2006), *available at* [http://www.hm-treasury.gov.uk/stern\\_review\\_report.htm](http://www.hm-treasury.gov.uk/stern_review_report.htm) (follow “Part II: The economics of stabilization” hyperlink).

<sup>10</sup> IAN A. WAITZ, ET AL., AVIATION AND THE ENVIRONMENT: A NATIONAL VISION STATEMENT, FRAMEWORK FOR GOALS AND RECOMMENDED ACTIONS, REPORT TO THE UNITED STATES CONGRESS, at 18 (Dec. 2004), *available at* [http://web.mit.edu/aeroastro/partner/reports/congrept\\_aviation\\_envirn.pdf](http://web.mit.edu/aeroastro/partner/reports/congrept_aviation_envirn.pdf). “It is a fact that aircraft emit chemical species and produce physical effects (like condensation trails, or contrails) that most scientists believe affect climate. Scientific assessments also suggest that the resulting chemical and physical effects due to aviation are such that aviation may have a disproportionate effect on climate per unit of fuel burned when compared to terrestrial sources.” *Id.*

<sup>11</sup> See Petition For Rulemaking Seeking the Regulation of Greenhouse Gas

petitions claimed that that the EPA must regulate CO<sub>2</sub> and other GHGs that are emitted from aircraft, a requirement said to derive from Section 231 of the Clean Air Act (CAA)<sup>12</sup> governing aircraft emissions regulation.<sup>13</sup> The petitioners claim this argument is supported by the recent ruling of the U.S. Supreme Court in *Massachusetts v. EPA*.<sup>14</sup>

This article briefly addresses the question of whether or not these petitions will prevail. The majority of this article analyzes what measures, if any, Section 231 of the CAA presently authorizes the EPA to take in regulating GHG emissions from aircraft. This information will be particularly pertinent should the Obama Administration take an opposite, more aggressive approach to climate change regulation than the preceding Bush Administration.<sup>15</sup>

This article will look into the scope of the EPA's authority as described in the statutes, legislative history, promulgated regulations, and governing case law. Methods of emissions regulation permitted in the past and the potential authority for other types of regulations are of particular importance. Part II of this article will address the petitions filed and the background of the issue, specifically examining (1) the methods the petitions desire to implement to regulate GHGs from aircraft; (2) the reasons the petitions will likely fail; and (3) the technology available in the production of aircraft engines to reduce emissions.

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Emissions from Aircraft at 12-13, State of Cal. (Nov. 6, 2007), *available at* [http://ag.ca.gov/cms\\_attachments/press/pdfs/n1501\\_aircraft\\_petition\\_final.pdf](http://ag.ca.gov/cms_attachments/press/pdfs/n1501_aircraft_petition_final.pdf) [hereinafter California] (the petition was filed by California, Connecticut, New Jersey, New Mexico, Pennsylvania, the City of New York, the District of Columbia, and the South Coast Air Quality Management District); *see* Petition for Rulemaking Under the Clean Air Act to Reduce the Emission of Air Pollutants from Aircraft that Contribute to Global Climate Change at 9-12, Earthjustice et al. (Dec. 5, 2007), *available at* [http://www.oceana.org/fileadmin/oceana/uploads/Climate\\_Change/Marine\\_GHG\\_Petition\\_FINAL.pdf](http://www.oceana.org/fileadmin/oceana/uploads/Climate_Change/Marine_GHG_Petition_FINAL.pdf) [hereinafter Earthjustice] (the petition was filed by Earthjustice, Friends of the Earth, Oceana, and the Center for Biological Diversity).

<sup>12</sup> Clean Air Act, 42 U.S.C. § 7571 (2007) (Section 231 of the CAA is the governing authority from which EPA derives any power to oversee and regulate emissions from Aircraft).

<sup>13</sup> § 7571 (a)(2).

<sup>14</sup> *Massachusetts v. EPA*, 549 U.S. 497, 528 (2007).

<sup>15</sup> *See* BarackObama.com, *New Energy For America*, <http://my.barackobama.com/page/content/newenergy> (The Obama plan to confront climate change includes a cap and trade plan to reduce emissions eighty percent by 2050 and a commitment to "re-engage with the U.N. Framework Convention on Climate Change (UNFCCC) – the main international forum dedicated to addressing the climate problem. They will also create a Global Energy Forum of the world's largest emitters to focus exclusively on global energy and environmental issues.") [hereinafter Obama].

Part III of the article will examine the authority given to the EPA by Section 231 of the CAA. This analysis will include (1) an analysis of the text of the CAA itself; (2) a comparison of EPA's authority to regulate GHG emissions from aircraft with the basis of the EPA's authority to regulate emissions from mobile sources; and (3) an analysis of other sections of the CAA which may weaken the authority of Section 231. Part IV of this article will address the historical nature of the EPA's authority under the CAA, looking to the legislative history of the CAA, prior regulations promulgated under Section 231, Federal Register listings, and the historical level of deference to the Federal Aviation Administration (FAA). Part V of this article will examine case law which may provide insight as to the EPA's authority to regulate GHGs from aircraft as well as examining the EPA's recent Advanced Notice of Proposed Rulemaking (ANPR) regarding the regulation of GHGs. Finally, Part VI will address international and market-based concerns and inquiries regarding the regulation of GHGs from aircraft, addressing international barriers to regulation and if such regulations are necessary at all given market forces on the industry.

This article concludes that there is more authority given to the EPA to regulate GHG aircraft emissions through fuel economy standards enforced during engine production than through operational fuel conservation standards. In its recent ANPR, the EPA acknowledged it might have the authority to enforce such provisions.<sup>16</sup> Additionally, the Supreme Court has ruled that the EPA has similar authority to regulate motor vehicles.<sup>17</sup> The EPA relied upon this authority in rejecting California's waiver request to self-regulate GHG emissions.<sup>18</sup> Both of these findings relied on language in Section 202 that is contained in Section 231 as well. However, differences also exist in the language of the statutes; the

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<sup>16</sup> Regulating Greenhouse Gas Emissions under the Clean Air Act, Docket No. EPA-HQ-OAR-2008-0318, (Jul. 11, 2008) at 215, *available at* <http://www.epa.gov/climatechange/emissions/downloads/ANPRPreamble.pdf> (reprinted at 73 Fed. Reg. 44354 (2008)) [hereinafter ANPR].

<sup>17</sup> See *Mass.*, 549 U.S. at 533.

<sup>18</sup> See Press Release, EPA, America Receives a National Solution for Vehicle Greenhouse Gas Emissions, (Dec. 19, 2007), *available at* <http://www.epa.gov/> [hereinafter National Solution] (follow "Newsroom" hyperlink; then follow "News releases by date" hyperlink; then follow); *but see* Barack Obama, Memorandum for the Administrator of the EPA, State of California Request for Waiver Under 42 U.S.C. 7543(b), the Clean Air Act, (Jan. 26, 2009) *available at* [http://www.whitehouse.gov/the\\_press\\_office/Presidential\\_Memorandum\\_EPA\\_Waiver/](http://www.whitehouse.gov/the_press_office/Presidential_Memorandum_EPA_Waiver/).

differences between the statutory language of Section 202 and Section 231 may influence what authority the EPA is given to regulate GHGs from aircraft emissions.

The article's conclusion regarding the EPA's possible authority to regulate GHG aircraft emissions using fuel economy standards is strengthened given: (1) the historical trend to conform aircraft emissions standards to the international standard; and (2) the decision of the International Civil Aviation Organization (ICAO) not to regulate GHG emissions because the primary methods of doing so are through fuel efficiency standards.<sup>19</sup> Given these reasons, the proposed fuel efficiency regulations installed during production appear more viable for actual implementation by the EPA than the conservation-based operational methods which may be better suited as guidance programs under Section 108 of the CAA.<sup>20</sup>

## II. Petitions and Background

### *A. How the Petitions Request that the EPA Regulate Aircraft GHG Emissions and Why They Will Not Succeed in Forcing Implementation*

The recently filed petitions by Earthjustice and California request the imposition of both technology-based fuel efficiency standards and operational-based fuel conservation efforts as law to reduce emissions of GHGs from aircraft.<sup>21</sup> As discussed below, neither petition seems likely to succeed in forcing the EPA to regulate GHG emissions from aircraft. However, laws similar to those requested in both petitions may very well be established in some form if the EPA so desires.

The two petitions filed, one by Earthjustice,<sup>22</sup> and one by the State of California, request that the EPA, in light of the recent *Massachusetts v. EPA* ruling,<sup>23</sup> regulate emissions of GHGs from

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<sup>19</sup> See Int'l Civil Aviation Org., Envtl. Unit, Aircraft Engine Emissions, <http://www.icao.int/icao/en/env/aee.htm> [hereinafter ICAO].

<sup>20</sup> 42 U.S.C. § 7408(f)(1)(A). Section 108 of the CAA provides that the EPA can issue guidelines for fuel conservation strategies for mobile sources.

<sup>21</sup> California, *supra* note 11, at 17-9; Earthjustice, *supra* note 11, at 8-9.

<sup>22</sup> Earthjustice filed the petition on behalf of Oceana, Friends of the Earth, and the Center for Biological Diversity. Earthjustice, *supra* note 11, at 2.

<sup>23</sup> Mass., 549 U.S. at 534.



aircraft engines. First, both petitions request that the EPA make a finding that GHG emissions from aircraft “may reasonably be anticipated to endanger public health and welfare.”<sup>24</sup> The Earthjustice petition requests that the EPA issue proposed standards to regulate these emissions and after such standards are issued, regulations to achieve the standards be promulgated.<sup>25</sup> The Earthjustice petition also suggests technological methods to regulate GHGs from aircraft engines, including increased fuel efficiency.<sup>26</sup> Further, the Earthjustice petition suggests operational fuel conservation measures including: minimizing idling times on runways; employing single engine taxiing; reducing engine thrust and reverse during takeoff and landing; choosing fuel efficient routes and reducing stopovers; reducing the use of auxiliary power units; reducing the amount of excess fuel carried; implementing continuous descent approaches; and requiring increased maintenance and cleaning.<sup>27</sup>

The California petition also requests that the EPA propose and adopt new standards and regulations.<sup>28</sup> The California petition makes several similar suggestions for methodology as the Earthjustice petition. They include technology-based solutions; implementation of continuous descents; increased landing operations per hour; reducing the use of auxiliary power units; single engine taxiing; selection of fuel efficient routes and reducing the amount of excess fuel carried.<sup>29</sup>

While these petitions provide an excellent framework for the available methods that the EPA may want to pursue when regulating GHG emissions from aircraft, they do not appear likely to persuade the EPA to do so for three reasons. First, the President (Executive Branch), on the advice of the Secretary of Transportation may veto any regulation pertaining to regulation of aircraft emissions through Section 231 of the CAA for the simple reason of safety concerns.<sup>30</sup> The President may overturn them on safety grounds by providing only a “reasonably specific”

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<sup>24</sup> Earthjustice, *supra* note 11, at 26.

<sup>25</sup> *Id.*

<sup>26</sup> *Id.* at 8-9.

<sup>27</sup> *Id.* at 10.

<sup>28</sup> California, *supra* note 11, at 13.

<sup>29</sup> *Id.* at 12-3.

<sup>30</sup> 42 U.S.C. § 7571(c) (2007).

rationale.<sup>31</sup> This standard appears easily met for suggested operational procedures such as carrying less excess fuel and adjusting flight patterns to reduce fuel burn.<sup>32</sup> For instance, the need for flexibility in rerouting could be compromised by carrying less fuel. Second, it is customary for the U.S. to follow international standards, and the international standards thus far do not regulate GHG emissions from aircraft.<sup>33</sup> Finally, it is unclear how much authority Section 231 actually gives the EPA to implement such standards even if an endangerment finding is made for GHGs and they are listed as criteria pollutants in the CAA.

The purpose of this article is to examine the last two barriers discussed above: the authority given to the EPA by the CAA, and what international and domestic barriers this authority faces. Assuming that the Administration desires to regulate GHG emissions from aircraft and therefore would not exercise the statutorily authorized veto over any proposed regulations, to what extent does the CAA authorize the EPA to regulate, and what international and market barriers do they face in light of such regulation? Before analyzing what authority the EPA has to implement regulations, it is important to understand the existing technology capable of reducing GHG emissions from aircraft.

*B. The Available Technology to Regulate GHG Emissions From Aircraft*

A brief examination of technology that is either currently available or possible in the future is useful in looking at what GHG emissions the EPA should and could regulate. There are many promising technology-based improvements in the engine itself, the aircraft design, and fuel efficiency that may significantly reduce GHG emissions from aircraft in the future.<sup>34</sup> Pratt and Whitney, a leading manufacturer of aircraft engines, has developed a promising Geared Turbofan engine which is said to increase efficiency, cut CO<sub>2</sub> emissions by 1500 tons per year, and cut NO<sub>x</sub> emissions in half. This is partially achieved by a 12% -

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<sup>31</sup> *Id.*

<sup>32</sup> *Id.*

<sup>33</sup> See ICAO, *supra* note 19.

<sup>34</sup> 49 U.S.C. § 44714 (2007) (The EPA does not have authority to regulate the fuel itself, this lies in the power of the Federal Aviation Administration).

15% reduction in fuel burn compared to today's average engines.<sup>35</sup> The Geared Turbofan engine is expected to be in regular use in planes manufactured by Mitsubishi and Bombardier by 2013.<sup>36</sup>

Pratt and Whitney also have other fuel-saving technologies that decrease GHG emissions such as an EcoPower Engine Wash which, if performed twice a year, reduces fuel burn by 1.2%.<sup>37</sup> General Electric is also exploring ways to cut emissions, primarily focusing on cutting fuel consumption with new fans and composite materials.<sup>38</sup> Additionally, companies like Airbus are looking into alternative fuels, while Boeing is researching hydrogen fuel cells and the use of composite materials to lower the weight of the aircraft and therefore lower the fuel burn, consequently lowering emissions.<sup>39</sup> Finally, other manufacturers, such as Volvo, have explored alternative fuels, lighter engines to increase fuel efficiency, and more efficient flight routes.<sup>40</sup> This technology is showing some positive signs. Thus, although GHG emissions from aircraft are growing, the industry is actually becoming increasingly efficient. The fuel consumption per passenger on a standard Boeing passenger plane has nearly halved since 1960 and is lower than that of an average automobile.<sup>41</sup> With the emergence of new technology and operational standards, the question remains as to what extent the EPA's authority, if any, extends to regulate this industry.

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<sup>35</sup> Dave Demerjian, *Greener Jet Engine Could Reduce Aviation's Carbon Footprint*, WIRED, June 24, 2008, <http://www.wired.com/print/cars/futuretransport/news/2008/06/ecoaviation23>;

see also Press Release, Pratt & Whitney, Pratt & Whitney Announces New Geared Turbofan Technology Partnerships (July 18, 2006), available at <http://www.pw.utc.com> (follow "Media Center" hyperlink; then follow "Press Releases" hyperlink; then follow "Environment" hyperlink; then follow "Green Services" hyperlink).

<sup>36</sup> Demerjian, *supra* note 35.

<sup>37</sup> EcoPower Engine Wash., <http://www.pw.utc.com> (follow "Corporate Citizenship" hyperlink; then follow "Environment" hyperlink; then follow "Green Services" hyperlink).

<sup>38</sup> Michael Mechem, *GENx Development Emphasizes Composites, Combustor Technology*, Aviation Week, April 16, 2006, available at [http://www.aviationweek.co.uk/aw/generic/story\\_generic.jsp?channel=mro&id=news/aw041706p1.xml](http://www.aviationweek.co.uk/aw/generic/story_generic.jsp?channel=mro&id=news/aw041706p1.xml).

<sup>39</sup> Demerjian, *supra* note 35.

<sup>40</sup> Aero Environment, A Magazine about Aviation and the Environment from Volvo Aero, (Volvo Aero, Trollhattan, Sweden) 2007, at 22, 30, 31, available at <http://www.volvo.com> (follow "Volvo Aero" hyperlink; then follow "News and Media" hyperlink; then follow "Publications" hyperlink; then follow "Environment Issue" hyperlink).

<sup>41</sup> *Id.* at 6.

### III. The EPA's Authority as Derived from the Text of the CAA

The CAA only authorizes the EPA to regulate aircraft engines, not the entire aircraft. However, legislative history refers to the engine as a complete system, meaning that all the different parts contributing to the engine would be included in the definition, not simply the one jet or motor engine itself.<sup>42</sup> All previous regulations under both Section 231 and Section 202 of the CAA<sup>43</sup> have been technology based and are not analogous to the proposed conservation measures. Of the two types of regulation, the fuel conservation efforts appear much more controversial for the EPA to implement under Section 231 and more prone to challenge by industry if implemented. While the EPA has more authority justifying the use of fuel efficiency standards implemented during engine production than to the proposed operational standards, some uncertainty remains regarding the applicability of technology forcing fuel efficiency regulations.

There is no doubt that when the CAA was written, and the subsequent major amendments were adopted, CO<sub>2</sub> and other GHGs were not the driving force behind the statutes or the regulations promulgated thereafter.<sup>44</sup> Thus, regulation of GHGs under the CAA has been likened to placing "new wine into old bottles,"<sup>45</sup> meaning that using the CAA as the vehicle for regulation would be using a statute that was not specifically designed to meet the needs of the different and global problem presented by climate change.

Some experts have suggested that it may be preferable to establish a new legislative framework that applies solely to GHGs, because such legislation would be more effective and efficient in addressing the problem at hand.<sup>46</sup> However, no such statutory regime currently exists.<sup>47</sup> In order to address the problem as soon as possible, perhaps while such a regime is being crafted, it is

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<sup>42</sup> See H.R. REP. NO. 91-1146 (1970), *reprinted in* 1970 U.S.C.C.A.N. 5356, 5370 [hereinafter HOUSE REPORT].

<sup>43</sup> 42 U.S.C. § 7521 (2007). Section 202 of the CAA provides the EPA authority to regulate emissions of pollutants from mobile sources such as motor vehicles.

<sup>44</sup> Nordhaus, *supra* note 5, at 61-3 (discussing the difficulties in integrating a new different element such as CO<sub>2</sub> into a pre-existing statutory regime such as the CAA).

<sup>45</sup> *Id.* at 53.

<sup>46</sup> *Id.* at 72; *see also* Doran, *supra* note 3, at 181; *but see* McKinstry, *supra* note 3.

<sup>47</sup> See Victor Flatt, *Taking the Legislative Temperature: Which Federal Climate Change Legislative Proposal is "Best"?*, 102 NW. U. L. REV. COLLOQUY 123 (2007) (describing current climate change proposals).

important to examine the CAA to identify what, if any, authority it may give a proactive administration to regulate GHG emissions from aircraft.

### *A. Language of Section 231 and Other CAA Statutes*

Section 231 of the CAA states that “[t]he Administrator shall, from time to time, issue proposed emission standards applicable to the emission of any air pollutant from any class or classes of aircraft engines which in his judgment causes, or contributes to, air pollution which may reasonably be anticipated to endanger public health or welfare.”<sup>48</sup>

After issuing the proposed emission standards, the EPA is required to hold public hearings within ninety days of issuing proposed regulations and issue the final regulations with adequate modifications as required following the hearings.<sup>49</sup> The regulations should take effect “after such a period . . . to permit the development and application of the requisite technology.”<sup>50</sup> Many of the terms in the statute are terms of art. The statute incorporates the definition of “aircraft engine” from the Federal Aviation Act (FAA).<sup>51</sup> The FAA defines an “aircraft engine” as “an engine used, or intended to be used, to propel an aircraft, including a part, appurtenance, and accessory of the engine, except a propeller.”<sup>52</sup> The terms “emission standard” and “air pollutant” are broadly defined in the CAA general definition section.<sup>53</sup>

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<sup>48</sup> 42 U.S.C. § 7571(a)(2).

<sup>49</sup> § 7571(a)(3).

<sup>50</sup> § 7571(a)(4).

<sup>51</sup> § 7574.

<sup>52</sup> 49 U.S.C. § 40102(a)(7) (2007).

<sup>53</sup> 42 U.S.C. § 7602(g) (providing the following definition:

The term ‘air pollutant’ means any air pollution agent or combination of such agents, including any physical, chemical, biological, radioactive (including source material, special nuclear material, and byproduct material) substance or matter which is emitted into or otherwise enters the ambient air. Such term includes any precursors to the formation of any air pollutant, to the extent the Administrator has identified such precursor or precursors for the particular purpose for which the term ‘air pollutant’ is used);

42 U.S.C. § 7602 (k) (providing the following definitions:

The terms ‘emission limitation’ and ‘emission standard’ mean a requirement established by the State or the Administrator which limits the quantity, rate, or concentration of emissions of air pollutants on a continuous basis, including any requirement relating to the operation or maintenance of a source to assure continuous emission reduction,

*B. Comparison of Section 231 to Section 202 Mobile Source Emissions*

The language of Section 231 is very similar to the language of the CAA's Mobile Source Emissions that is relied upon to regulate vehicle emissions in Section 202. Since Section 202 has been utilized more, interpretations of it may be useful in examining Section 231. Section 202 was the section at issue in *Massachusetts v. EPA*, in which the Court gave the EPA authority to regulate GHG emissions from automobiles if an endangerment finding was made; it is additionally the source for CAFE fuel standard authority.<sup>54</sup>

It is also important to note the differences in the language between the statutes. Section 202 is limited to regulating "new" motor vehicles or "new" motor vehicle engines. Section 231 does not have the restricting term "new" applied to it, leaving open the possibility of regulating engines that are already in use. However, it should be noted that Section 202 applies to both "motor vehicles" and "motor vehicle engines," while Section 231 only applies to "aircraft engines." This possibly limits the application of the statute in contrast to broader interpretations of Section 202.<sup>55</sup> Since Congress chose to distinguish "motor vehicles" from "motor vehicle engines," both terms of art in the CAA, it could be argued that Congress wished to distinguish emissions from "aircraft engines" from emissions from aircrafts. This interpretation would limit the EPA's reach, especially when determining if the EPA could regulate operational practices of the entire plane to reduce GHG emissions.

Additionally, Section 202 lists pollutants for which the regulations on motor vehicle emissions must meet the "greatest degree of emission reduction achievable through the application of

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and any design, equipment, work practice or operational standard promulgated under this chapter).

<sup>54</sup> Mass., 549 U.S. at 529; *see also* Nordhaus, *supra* note 5, at 53-6; *see also* National Solution, *supra* note 18. CAFE is an acronym for Corporate Average Fuel Economy and means that the average vehicle must achieve this mandated fuel efficiency. *See* National Highway Traffic Safety Administration, *Law/Regulations/Guidance-Café*, available at <http://www.nytsa.dot.gov/portal/site/nhtsa/menuitem.43ac99aefa8569eea57529cdba046a0/>.

<sup>55</sup> *See* I.N.S. v. Cardoza-Fonseca, 480 U.S. 421, 447-48 (1987) (establishing the rule of statutory interpretation that terms that are included in parts of a statute and omitted in others can be interpreted to have been intentionally omitted); *see also* Albright v. Oliver, 510 U.S. 266, 273 (1994); *infra* notes 65-71 and accompanying text for further discussion of Section 108 of the CAA and elements of statutory interpretation.

technology.”<sup>56</sup> This type of standard does not exist in Section 231; once again implementation of Section 231 seems much more discretionary than Section 202. Finally, Section 202 states that the EPA “shall by regulation prescribe . . . standards.”<sup>57</sup> In contrast, Section 231 states that the EPA must “issue proposed emission standards” that then will undergo hearings and that the Administrator “shall issue such regulations with such modifications as he deems appropriate.”<sup>58</sup> This language gives the EPA more discretion in what type of regulations to issue, perhaps including discretion to decide whether final regulations need to be issued at all. Again, assuming that the EPA is seeking to regulate GHG emissions, this final difference is not as crucial as it would be if third parties were attempting to force the EPA to regulate as the petitioners discussed earlier do.<sup>59</sup>

There is also an entire part present in Section 231 that is not present in Section 202. Section 231(c) gives the President power to disapprove of any regulation if there is a “finding by the Secretary of Transportation that any such regulation would create a hazard to aircraft safety.”<sup>60</sup> The only qualification is that such a finding includes “a reasonably specific statement of the basis upon which the finding was made.”<sup>61</sup> This again appears very broad; “reasonably specific statements” could most likely be made to discourage many of the operational proposals, such as carrying less fuel. The fragmentation of administrative authority is another obstacle for implementation by the EPA. Given the power the statute assigns the Department of Transportation (DOT), it will be necessary for the EPA to secure the support of the DOT in order to adopt such standards or regulations. Such overlapping authority and interagency cooperation may be beneficial to the system by providing internal checks and balances on the executive and promoting a cohesive policy;<sup>62</sup> however, it could also be

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<sup>56</sup> 42 U.S.C. § 7521(a)(3)(A)(i).

<sup>57</sup> 42 U.S.C. § 7571.

<sup>58</sup> *Id.*

<sup>59</sup> See *supra* notes 20-31 and accompanying text.

<sup>60</sup> 42 U.S.C. § 7571 (c).

<sup>61</sup> *Id.*

<sup>62</sup> Neal Kumar Katyal, *Internal Separation of Powers: Checking Today's Most Dangerous Branch from Within*, 115 YALE L.J. 2314, 2326-27 (2006) (internal citations omitted) (discussing how overlapping powers may provide necessary checks on authority, but a President may trump both regardless:

In theory, because each department serves a different core

burdensome and delay implementation.

It is interesting to note that the duty of regulating the actual composition of the fuel itself falls upon the FAA.<sup>63</sup> While the CAA may authorize the EPA to regulate the fuel efficiency of an engine in Section 231, neither Section 231 nor Section 211 gives the EPA authority over the fuel itself.<sup>64</sup> Instead this responsibility is given to the FAA, which must regulate fuel to correspond with emissions regulated under Section 231:

The Administrator of the Federal Aviation Administration shall prescribe - standards for the composition or chemical or physical properties of an aircraft fuel or fuel additive to control or eliminate aircraft emissions the Administrator of the Environmental Protection Agency decides under section 231 of the Clean Air Act (42 U.S.C. 7571) endanger the public health or welfare.<sup>65</sup>

Thus, if greenhouse gases are regulated under Section 231, it seems the FAA is required to monitor emissions by regulating the composition of the fuel itself.

### *C. Importance of Section 108 – Control Measures*

The existence of Section 108 of the CAA may indicate that Congress did not intend to include operational standards limiting how and when a vehicle or aircraft is operated as “emissions standards” under Section 202 or 231. Section 108 instructs the EPA to “publish and make available to appropriate Federal, state and local environmental and transportation agencies” information “regarding the formulation and emission reduction potential of

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constituency, the overlap should produce internal checks. But practice has deviated from theory for three reasons. First, because agencies can be cut out of relevant decisions by political actors, formal overlap has been made irrelevant. Second, even when agencies have been consulted, political influence has compromised the redundant system. Third, redundancy's benefits have collapsed as the legal decision-maker, the Office of Legal Counsel, has been structurally compromised. These problems illustrate that overlapping jurisdiction creates only an architecture to enable internal checks. Without more, that structure collapses under the weight of presidential influence.)

<sup>63</sup> 49 U.S.C. § 44714 (2007).

<sup>64</sup> 42 U.S.C. § 7571; 42 U.S.C. § 7545. Section 211 of the CAA establishes EPA's limited authority over the regulation of fuels.

<sup>65</sup> 49 U.S.C. § 44714.



transportation control measures related to criteria pollutants and their precursors.”<sup>66</sup> Section 108 lists several examples of what this information should include such as: trip reduction ordinances, traffic flow improvement programs, shared ride services, high occupancy vehicle restrictions, and peak use restrictions.<sup>67</sup> While most of these listed examples pertain to emissions from motor vehicles, the publication and provision of these types of programs is not limited by the statute to motor vehicles. These types of fuel saving programs for motor vehicles seem analogous to the types of operational changes that the petitions demand for aircrafts.<sup>68</sup>

In addition, Section 108 acts as evidence that Congress was aware of conservation-based methods of reducing emissions when it drafted the CAA. Since they have been explicitly enumerated here, and are not present in Sections 202 or 231, an argument could be made that Congress did not intend for the EPA to include such operation-based emission reduction strategies when setting emission standards for motor vehicles or aircraft engines.

This argument is strengthened by several canons of statutory interpretation. First, a specific statutory enumeration will trump a general one.<sup>69</sup> More specific to this situation is the interpretation that “[t]he law is settled that however inclusive may be the general language of a statute, it will not be held to apply to a matter specifically dealt with in another part of the same enactment.”<sup>70</sup> The Supreme Court has further explained this rule of statutory interpretation stating that “where Congress includes particular language in one section of the statute but omits it in another section of the same act, it is generally presumed that Congress acts intentionally and purposely in the disparate inclusion or exclusion.”<sup>71</sup> Finally, and pertinent to Section 108 of the CAA’s effect on the authority of Section 231 to impose operational

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<sup>66</sup> 42 U.S.C. § 7408(f)(1)(A). It is important to note that this statute, similar to Section 202 and Section 231 of the CAA would not apply to CO<sub>2</sub> until an endangerment finding is made and CO<sub>2</sub> officially becomes a listed criteria pollutant. *Id.*

<sup>67</sup> § 7408(f)(1)(A)(i)–(ix).

<sup>68</sup> See *supra* notes 20-31 and accompanying text for a discussion of operational standards asked for in the petitions from California and Earthjustice.

<sup>69</sup> *Nguyen v. U.S.*, --- F.3d ---, 2008 WL 4631719 (11th Cir.2008). “Our construction of § 2680(a) and (h) and the proviso is in keeping with applicable canons of statutory construction. To the extent of any overlap the more specific provision trumps the general one.” *Id.* at 6.

<sup>70</sup> *Doe v. National Bd. of Medical Examiners*, 199 F.3d 146,155 (3rd Cir. 1999).

<sup>71</sup> *Cardoza-Fonseca*, 480 U.S. at 447-48; see also *Albright*, 510 U.S. at 273.

standards to regulate aircraft emissions, “[t]his principle has special force when Congress has targeted specific problems with specific solutions in the context of a general statute . . . particularly when the two [provisions] are interrelated and closely positioned, both in fact being parts of the same statutory scheme.”<sup>72</sup> Thus, it may be advisable and more pragmatic for the EPA to publish and make available operational standards similar to those discussed in the petitions under Section 108, reserving the use of Section 231 solely for the engine efficiency emission standards.

#### **IV. The EPA’s Authority Based on the History of the CAA**

##### *A. The Legislative History of Section 231*

The legislative history is limited in its discussion of aircraft emissions, but does provide some insight to what Congress intended when it enacted the section. The House Report states: “Such standards would be enforced by the Administrator in the certification and inspection of aircraft engines pursuant to his authority under the Federal Aviation Act of 1958.”<sup>73</sup> Since the FAA certification process occurs before an engine is certified for operation and includes “tests and inspections” of “emissions requirements,” it is unclear how operational procedures, such as carrying less fuel or idling less, could be enforced during the certification process.<sup>74</sup> An argument could be made that this indicates these were not the types of regulations Congress intended to authorize under Section 231. This point is bolstered later in the House Report which states:

Such standards are to include requirements with respect to manufacturers’ warranty of such systems or devices. Any such standards shall be prescribed only after consultation with the Federal Aviation Administrator in order to assure appropriate consideration for aircraft safety. The Administrator is directed to apply such standards in the certification and inspection of aircraft or engines pursuant to his authority under the Federal

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<sup>72</sup> Doe, 199 F.3d at 155 (internal quotations omitted).

<sup>73</sup> HOUSE REPORT, *supra* note 42, at 5359.

<sup>74</sup> 14 C.F.R. § 21.21 (2007), *see also* 14 C.F.R. § 21.500 (2007).

Aviation Act of 1958.<sup>75</sup>

Once again there is mention of prior inspection to enforce emissions regulations, and there are references to “devices” and “systems,” categories into which the operational procedures mentioned above would most likely not fall.

The House Report also addresses whether or not the emissions standards would be limited to just the engine or if they meant the plane as a complete system. The report states:

Section 231 directs the Secretary to prescribe, as soon as practicable, giving appropriate consideration to technological feasibility and economic cost, emission standards for any class of aircraft or aircraft engines which cause or contribute to air pollution endangering the health or welfare of any persons. Such standards are to apply, whether the aircraft or engines are designed as complete systems or whether they incorporate other devices to prevent or control pollution.<sup>76</sup>

This statement refers to emissions standards applicable by “devices.” However, the language referring to the standards governing the engine or plane as a complete system may indicate that the suggested technology-based regulations, such as more fuel-efficient engine systems, could be viable despite the fact that the statute only specifies aircraft engines for regulation.

Finally, the Conference Report provides insight regarding the use of the same standard to evaluate the regulation of a pollutant from any source. In other words, if the same reasons exist to regulate CO<sub>2</sub> from a motor vehicle and to regulate CO<sub>2</sub> from a plane, then both need to be regulated. The report states that the statutory regime:

Provides a uniform standard of proof for EPA regulation of air pollutants which applies to the setting of (1) criteria for national ambient air quality standards under Section 108; (2) new stationary source performance standards under Section 111; (3) hazardous stationary source emission standards; (4) new auto emission standards under Section 202; (5)

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<sup>75</sup> HOUSE REPORT, *supra* note 42, at 5370.

<sup>76</sup> *Id.*

regulations of fuels and fuel additives under Section 211; (6) aircraft emission standards under Section 231. In all future rulemaking in these areas, the Administrator could regulate any air pollutant from those sources, the emissions of which in his judgment cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare.<sup>77</sup>

This uniform standard will be addressed below in the section of this article discussing case law.<sup>78</sup>

### *B. Section 231 Regulations and the Federal Register*

Examination of the type of regulations the EPA has already implemented for other pollutants under its authority is useful in determining the scope of emissions regulations that may be suitable under Section 231. Regulations have been established to regulate aircraft emissions of hydrocarbons, carbon monoxide, oxides of nitrogen concentrations, smoke exhaust, and fuel venting.<sup>79</sup> All listed aircraft pollutants are tested by an emissions test established in the regulations that measures exhaust levels during different engine functions.<sup>80</sup> The regulations have established acceptable levels of output that must be met. Interestingly, the emissions test in the regulations is already designed to test emission levels of carbon dioxide, but no standard has been set.<sup>81</sup> There are no conservation-based operational standards similar to those requested in the petitions applicable to other pollutants; all of the emissions standards for aircraft engines appear to be technology-based. These regulations are similar to those governing emissions from motor vehicles.<sup>82</sup>

The Federal Register could also prove helpful. Here, again, the record is limited and generally refers only to establishing the type of emissions standards mentioned above. However, the Federal Register record shows that there is a history of revisiting

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<sup>77</sup> H.R. Rep. No. 95-564 (1977) (Conf. Rep.), as reprinted in 1977 U.S.C.C.A.N. 1502, 1564 [hereinafter Conference Report].

<sup>78</sup> See *infra* notes 94-96 and accompanying notes.

<sup>79</sup> 40 C.F.R. § 87.11; 40 C.F.R. § 87.21; 40 C.F.R. § 87.31; 40 C.F.R. § 87.60 (2007).

<sup>80</sup> 40 C.F.R. § 87.60.

<sup>81</sup> *Id.*

<sup>82</sup> 40 C.F.R. § 85.2201 to § 85.2404.

the standards and customizing them to new environmental threats. In particular, the regulations responded to the ozone threat with a new standard for oxides of nitrogen in 1997, which was subsequently amended again in 2005.<sup>83</sup>

The Federal Register history also shows a trend and desire to conform to the international standards established by the ICAO's Air Transport Bureau.<sup>84</sup> Although the ICAO is well aware of the threat of GHG emissions caused by aircraft travel, the IPCC at the ICAO's request included this in its climate change analysis begun in 1997, it has not established standards for carbon dioxide or other GHG emissions from aircraft similar to those established for other pollutants, nor does it plan to. The ICAO explains its policy stating:

In the case of CO<sub>2</sub>, it has been decided not to develop an ICAO standard, since CO<sub>2</sub> production is directly related to fuel consumption and there is already intense economic pressure to keep fuel consumption to a minimum and, in addition, there would be significant difficulties in designing a certification condition.<sup>85</sup>

The role of the ICAO and other international barriers, as well as the market effect, is discussed at further length in section VI below.

### *C. Deference to the Federal Aviation Administration*

The FAA also plays a large role in regulating the aircraft industry. The interplay between the FAA and the EPA in regulating aircraft emissions could also lead to potential pitfalls if an administration chooses to regulate GHG emissions from aircraft under the CAA. This is especially true when examining the operational standards proposed in the petitions. Such standards have typically been under the control of the FAA. For example, the FAA has contended, and the 4th Circuit has confirmed, that they do not need to consider aircraft emissions when making

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<sup>83</sup> Control of Air Pollution from Aircraft and Aircraft Engines; Emission Standards and Test Procedures, 62 Fed. Reg. 25356-01 (May 8, 1997); Control of Air Pollution from Aircraft and Aircraft Engines; Emission Standards and Test Procedures, 70 Fed. Reg. 69664-01 (Nov. 17, 2005).

<sup>84</sup> 62 Fed. Reg. 25356-01.

<sup>85</sup> ICAO, *supra* note 19.

decisions about criteria such as the length of runways or airport expansion.<sup>86</sup>

Additionally, the FAA and the EPA must consult one another when either agency approves procedures or processes inconsistent with emissions testing procedures and in the enforcement of emissions regulations.<sup>87</sup> This interagency cooperation (since the FAA is housed in the Department of Transportation) is another hurdle that must be cleared before the EPA can implement any program it desires to regulate GHG emissions from aircraft.

## V. Case Law Determining the EPA's Authority

There is relatively little case law interpreting Section 231, but two cases do directly address questions posed by this article.

### A. *National Association of Clean Air Agencies v. EPA*

*National Association of Clean Air Agencies v. EPA* is a suit challenging the Final Rule that established a new emission standard for oxides of nitrogen.<sup>88</sup> The challenge was based on the fact that all of the planes already had to meet the set standard based on the ICAO's international rules. Petitioners argued that the EPA should not promulgate a standard that will not achieve any actual reduction and is not "technology forcing," and thus asserted that the regulation was not in accordance with the law.<sup>89</sup>

The Court's analysis affords great deference to agency interpretation of the statute. The EPA argued that in interpreting Section 231 the agency should be given even broader than normal discretion due to the lack of specified standards the emission standards should satisfy.<sup>90</sup> The dispute centered on the Final Rule providing that: "other provisions of the CAA require the EPA to obtain the 'greatest degree of emission reduction achievable.'

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<sup>86</sup> *City of Olmsted Falls v. FAA*, 292 F.3d 261, 269-274 (D.C. Cir. 2002); see also Rebecca Clarke and Wendy Davis, *Hot Air: Undue Judicial Deference to Federal Aviation Administration Expertise in Assessing the Environmental Impacts of Aviation*, 69 J. AIR L. & COM. 709, 734-37 (2004). "The FAA contends that there is 'no known cause and effect relationship between airplane emissions and human health' and therefore the Fourth Circuit has found it reasonable for the FAA not to study these effects further and to omit such effects from an EIS. The findings of the EPA, described in Section I (D) above, are in direct conflict with this statement." *Id.* at 734 (internal citations omitted).

<sup>87</sup> Clarke, *supra* note 86, at 736.

<sup>88</sup> *National Ass'n of Clean Air Agencies v. E.P.A.*, 489 F.3d 1221 (D.C. Cir. 2007).

<sup>89</sup> *Id.* at 1224.

<sup>90</sup> *Id.* at 1226.

Section 231, however, does not contain such language. Thus, the Final Rule reasons, the EPA is not required to achieve a 'technology-forcing' result in the aircraft engine emissions context."<sup>91</sup>

The court, again giving great deference to the agency, held that: "Congress has delegated expansive authority to EPA to enact appropriate regulations applicable to the emission of air pollutants from aircraft engines. Because we find that the Final Rule is not 'manifestly contrary to the statute,' it must be given controlling weight. We therefore defer to EPA's construction of § 231."<sup>92</sup>

While the court does not directly approve the EPA's reasoning that they are not required to set a "technology forcing result," they defer to it. If a new administration directed the EPA to use a broad interpretation of Section 231, claiming expansive authority to regulate either fuel efficiency in aircraft engines, operational procedures to reduce the emissions of GHGs from aircraft, or both, this established deference in regards to Section 231 would be a large hurdle to overcome for potential challenges by industry or other parties to the potentially promulgated regulations. This high level of deference and difficulty in challenging agency interpretations of their governing statutes can be seen as an extension of the great deference afforded agencies in interpreting their governing statutes established in *Chevron v. NRDC*.<sup>93</sup>

### *B. Massachusetts v. EPA*

In *Massachusetts v. EPA*,<sup>94</sup> the Court addressed whether the EPA has the authority to regulate GHG emissions from motor vehicles under Section 202. Due to the similarity of the language used in Section 202 and Section 231, and to the "uniform standard of proof for EPA regulation of air pollutants" applying to both statutes, this case is relevant to the questions of the extent of the

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<sup>91</sup> *Id.* at 1230.

<sup>92</sup> *Id.*

<sup>93</sup> *Chevron U.S.A., Inc. v. Natural Resources Defense Council, Inc.*, 467 U.S. 837, 842-45 (1984) (Developing a two step process to determine if an agency interpretation was 'in accordance of law' under the Administrative Procedure Act. First, the Court would look to see if the specific question at hand had been addressed in the statute, if it had, the Court need look no further and simply apply the statute. If the specific question had not been addressed then the court must defer to the agency interpretation so long as it is reasonable).

<sup>94</sup> *Mass.*, 549 U.S. 497.

EPA's authority posed in this article.<sup>95</sup> The Court, in response to the EPA's claim that they could not regulate GHGs, stated that:

The statutory text forecloses EPA's reading. The Clean Air Act's sweeping definition of "air pollutant" includes "any air pollution agent or combination of such agents, including any physical, chemical... substance or matter which is emitted into or otherwise enters the ambient air..." § 7602(g) (emphasis added). On its face, the definition embraces all airborne compounds of whatever stripe, and underscores that intent through the repeated use of the word "any." Carbon dioxide, methane, nitrous oxide, and hydrofluorocarbons are without a doubt "physical [and] chemical . . . substance[s] which [are] emitted into . . . the ambient air." The statute is unambiguous.<sup>96</sup>

The court concludes stating:

In short, EPA has offered no reasoned explanation for its refusal to decide whether greenhouse gases cause or contribute to climate change. Its action was therefore "arbitrary, capricious, . . . or otherwise not in accordance with law." We need not and do not reach the question whether on remand EPA must make an endangerment finding, or whether policy concerns can inform EPA's actions in the event that it makes such a finding. We hold only that EPA must ground its reasons for action or inaction in the statute.<sup>97</sup>

While the EPA has yet to make an endangerment ruling concerning GHGs or list GHGs as criteria pollutants, they have taken some actions that are relevant to the petitions at hand.

In light of *Massachusetts v. EPA*, California renewed its request for a waiver from the CAA so it might set emissions standards for GHGs emitted from motor vehicles.<sup>98</sup> The EPA

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<sup>95</sup> Conference Report, *supra* note 77, at 1564.

<sup>96</sup> Mass., 549 U.S. at 500 (internal quotations and citations omitted).

<sup>97</sup> *Id.* at 533 (internal quotations and citations omitted).

<sup>98</sup> See JAMES MCCARTHY AND ROBERT MELTZ, CRS REPORT FOR CONGRESS, CALIFORNIA'S WAIVER REQUEST TO CONTROL GREENHOUSE GASES UNDER THE CLEAN AIR ACT (Oct. 1 2007) available at <http://www.ncseonline.org/NLE/CRSreports/07Oct/R L34099.pdf>.



finally ruled on the request, rejecting the waiver. In its press release announcing the rejection of the waiver, the EPA stated that it was unnecessary because the “EPA has determined that a unified federal standard of 35 miles per gallon will deliver significant reductions in greenhouse gas emissions from cars and trucks in all 50 states.”<sup>99</sup>

The EPA had originally argued in *Massachusetts v. EPA* that it could not regulate fuel efficiency under Section 202 because this authority was delegated to the Department of Transportation.<sup>100</sup> The Court disagreed, stating that the fact “that DOT sets mileage standards in no way licenses EPA to shirk its environmental responsibilities. EPA has been charged with protecting the public’s ‘health’ and ‘welfare,’ 42 U.S.C. §7521(a)(1), a statutory obligation wholly independent of DOT’s mandate to promote energy efficiency.”<sup>101</sup>

The fact that the courts have stated the EPA could regulate fuel efficiency in the case of vehicle emissions under Section 202, and the fact that the EPA itself has presented such action as a solution to GHG emissions could significantly bolster the EPA’s authority to require that technology-based fuel efficiency standards be placed on aircraft engines under Section 231. This is especially true because Section 231 contains the same “health” and “welfare” language relied upon by the Supreme Court.<sup>102</sup> On the other hand, the issues presented by the omission of the “greatest degree of emission reduction achievable” language from Section 231 still exist.<sup>103</sup> Finally, the ruling that the EPA’s authority to regulate was not stripped simply because DOT set fuel efficiency standards may be useful given the interplay between the FAA and the EPA required to regulate emissions from aircraft.<sup>104</sup>

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<sup>99</sup> National Solution, *supra* note 18. The Obama administration has indicated its intent to EPA to reexamine the California waiver request, opening the door for the possibility that this decision will be reversed and California and the other states following suit will be given the authority to regulate GHGs from mobile source emissions. See Barack Obama, Memorandum for the Administrator of the EPA, State of California Request for Waiver Under 42 U.S.C. 7543(b), the Clean Air Act, (Jan. 26, 2009) *available at* [http://www.whitehouse.gov/the\\_press\\_office/Presidential\\_Memorandum\\_EPA\\_Waiver/](http://www.whitehouse.gov/the_press_office/Presidential_Memorandum_EPA_Waiver/).

<sup>100</sup> Mass., 549 U.S. at 532.

<sup>101</sup> *Id.* (internal quotations and citations omitted).

<sup>102</sup> See 42 USC § 7571 (2007), *supra* note 12; see also Mass., *supra* note 14.

<sup>103</sup> See discussion *supra* p. 113.

<sup>104</sup> Clarke, *supra* note 86, at 736; see also Katyal, *supra* note 62, at 2326; see generally ANPR, *supra* note 16, at 80.

As a response to the ruling in *Massachusetts v. EPA*, the EPA released an Advanced Notice of Proposed Rulemaking<sup>105</sup> on July 11, 2008 addressing regulating GHGs under the CAA. This filing sheds some light on the agency's response to the ruling. However, with the change in administration this response is of course subject to change as well.

*C. Advanced Notice of Proposed Rulemaking (ANPR)*

Following the ruling in *Massachusetts v. EPA*, the only thing standing in the way of the listing of CO<sub>2</sub> as a criteria pollutant under the CAA was an endangerment finding by the EPA.<sup>106</sup> The ANPR discusses the regulation of aircraft emissions in two sections. First, a general section addresses Section 231 and explains its purpose.<sup>107</sup> Additionally, the ANPR directly addresses the petitions discussed above and asks for comments on them to be submitted for consideration.<sup>108</sup>

The general Section 231 discussion in the ANPR acknowledges the broad applicability of the statute and references the *National Association* case discussed previously in this article.<sup>109</sup> More importantly, and most relevant to this discussion, is the statement following this discussion: "As with sections 202(a) and 213(a)(4), this provision authorizes, but does not require, EPA to set technology-forcing standards to the extent appropriate considering all the relevant factors, including noise, safety, cost and necessary lead time for the development and application of requisite technology."<sup>110</sup>

This implies that the EPA is acknowledging it is within its right to enforce the technology-based fuel efficiency standards that both petitions demand. This statement appears fairly definitive, in that, if the EPA so desired, it believes it is within its authority to set technology forcing standards.

The section of the ANPR addressing the two petitions themselves does not provide much commentary or opinion as to the adequacy of the petitions or the EPA's feeling of its own

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<sup>105</sup> ANPR, *supra* note 16.

<sup>106</sup> *Id.* at 80-1.

<sup>107</sup> *Id.* at 215.

<sup>108</sup> *Id.* at 2-4.

<sup>109</sup> *Id.* at 215.

<sup>110</sup> *Id.* at 215.

authority in this area. Instead, it simply summarizes the petitions and asks for public comment on them. The ANPR specifically asks for comment on the following: (1) available technology to reduce GHGs; (2) whether the EPA has a mandatory duty to regulate GHGs and if such regulation can be consistent with governing international law; (3) the impact of aircraft GHG emissions on climate change; and (4) if there should be an endangerment finding for emissions of GHGs from aircraft.<sup>111</sup> Thus, the EPA is arguably noncommittal in the ANPR, making no commitment of action, yet not precluding any future action.

## VI. International and Market Concerns

### *A. International Barriers to Domestic Regulation*

The airline industry is a global industry. Any attempt to regulate the industry domestically will affect the international community, especially given the U.S. role in the global economy and the large amount of international travel to and from the United States.<sup>112</sup> This places the regulation of GHG emissions from aircraft in the United States in a unique position.

Both treaties and custom have significant roles in international law and regulation.<sup>113</sup> There is no existing treaty governing emissions from aircraft internationally. The Kyoto Protocol excluded international aircraft emissions from its target. "Instead, Article 2, paragraph 2 of the Kyoto Protocol states that the responsibility for limiting or reducing greenhouse gas emissions from aviation bunker fuels shall fall to the Annex I Parties, working through ICAO."<sup>114</sup>

In 1944, the Convention on International Civil Aviation was signed by fifty-two states and established the Provisional ICAO.<sup>115</sup> The ICAO was created in April 1947 and in October 1947 became

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<sup>111</sup> *Id.* at 317.

<sup>112</sup> Thirty-one percent of all annual worldwide airline travel was carried out by North American Airlines in 2007. ICAO, ANNUAL REPORT OF THE COUNCIL, Doc #9898 (2008) available at [http://www.icao.int/icaonet/dcs/9898/9898\\_en.pdf](http://www.icao.int/icaonet/dcs/9898/9898_en.pdf).

<sup>113</sup> INTERNATIONAL ENVIRONMENTAL LAW: CASES, MATERIALS, PROBLEMS 237-52 (Donald Anton, Jonathan Charney, Philippe Sands, Thomas Schoenbaum & Michael Young eds., 2007).

<sup>114</sup> ICAO, *supra* note 19 (correction: quote should refer to Annex B industrialized countries under Kyoto not Annex I).

<sup>115</sup> Arnold W. Reitze, Jr., *Mobile Source Air Pollution Control*, 6 ENVTL. LAW. 309, 434-435 (2000).

a specialized agency of the United Nations.<sup>116</sup> The ICAO first issued non-binding emissions regulations guidelines in 1981.<sup>117</sup> The regulations that were in place at the time in the U.S. were stricter than those issued by the ICAO.<sup>118</sup> However, in 1982 the United States scaled back these regulations to conform to the ICAO regulations.<sup>119</sup> Since that time, the United States has used Section 231 to adopt regulations that conform to the ICAO recommendations as they are made.<sup>120</sup>

The ICAO consists of nineteen members and eleven observers, and it could be argued that the international communities' adherence to their recommendations has become an international custom.<sup>121</sup> In this sense, the failure of the ICAO to address GHGs in their regulation guidelines could be problematic given the historical custom of both the United States and other nations to conform to the ICAO standards.<sup>122</sup> However, enforcement and "realpolitik"<sup>123</sup> make this concern much more of a minor issue than a true impediment if the United States decided to regulate GHGs from aircraft emissions. The likely result would simply be to force the international community to do so as well.

In fact, the international community may regulate GHG emissions from aircraft soon on its own. Many European nations have already begun their own regulation process.<sup>124</sup> An adopted European Union directive would include aircraft emissions in trading schemes by 2011.<sup>125</sup> This directive allots allowances for the emission of GHGs to aircraft operators coming to and leaving from European Union territories based on their average 2004-2006

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<sup>116</sup> ICAO, *supra* note 19.

<sup>117</sup> Reitze, *supra* note 115, at 434-35.

<sup>118</sup> ICAO, *supra* note 19.

<sup>119</sup> *Id.*

<sup>120</sup> Reitze, *supra* note 115, at 435.

<sup>121</sup> *Id.*

<sup>122</sup> ICAO, *supra* note 19.

<sup>123</sup> "Realpolitik" is defined as "politics based on practical and material factors rather than on theoretical or ethical objectives." MERRIAM-WEBSTER'S ONLINE DICTIONARY, *realpolitik*, <http://www.merriam-webster.com/dictionary/realpolitik>.

<sup>124</sup> *Commission Proposal for a Directive of the European Parliament and of the Council Amending Directive 2003/87/EC So as to Include Aviation Activities in the Scheme for Greenhouse Gas Emission Allowance Trading Within the Community*, COM(2006) 818 final (Dec. 20, 2006), <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2006:0818:FIN:EN:PDF>.

<sup>125</sup> *Id.*

emissions.<sup>126</sup> This would include domestic and international flights, and place the burden of the requirements on aircraft operators, allowing them to buy allowances if they exceed their allotments.<sup>127</sup> This framework indicates willingness by the international community to regulate, and may also serve as an example for the United States to follow if legislative action is eventually taken to establish a cap and trade scheme.<sup>128</sup>

Another potential issue is enforcement. Since the United States currently establishes the fuel efficiency and other regulatory requirements at the point of production, there is no framework or authority established for U.S. regulators, be it the EPA or the FAA, to test foreign manufactured planes entering their airspace.<sup>129</sup> In this sense it is really an issue that must be dealt with by the local government of the manufacturer. This is yet another reason why an international consensus is preferable in the aviation industry. In addition, this may negate some of the United States' "realpolitik" power to set its own standards and force the rest of the international community to adjust to them.

Finally the ICAO is confronting the issue of GHG emissions on fronts different from those of emission standards. Its criteria are more similar to those authorized under Section 108 of the CAA, which has issued guidelines for fuel conservation.<sup>130</sup> Fuel burn accounts for most GHG emissions from aircraft; therefore, reducing the amount of fuel used through these practices can significantly reduce total GHG emissions from aircraft.<sup>131</sup> While the ICAO has issued these guidelines, similar to those called for in Section 108 of the CAA, they are merely suggestions for how an industry may voluntarily reduce their emissions.<sup>132</sup> Because customarily the EPA mirrors the ICAO, this presents another potential impediment to the EPA making such suggestions mandatory, or even desiring to do so. Additionally, the ICAO is investigating alternative fuels and the potential for their use to

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<sup>126</sup> *Id.*

<sup>127</sup> *Id.*

<sup>128</sup> See *supra* note 113 and accompanying text for a discussion of market based approaches and cap and trade schemes.

<sup>129</sup> See 42 U.S.C. § 7571 (2007); see also 49 U.S.C. § 44714 (2007).

<sup>130</sup> ICAO, *supra* note 19.

<sup>131</sup> *Id.*

<sup>132</sup> *Id.*

decrease the emission of GHGs from aircraft.<sup>133</sup> The ICAO also acknowledges that there is an argument that formal regulation of GHG emissions from aircraft is unnecessary or overly burdensome on the international level because the market will take care of introducing fuel saving practices on its own, as evidenced by increasing fuel efficiency, and the complications of allocating emissions on international flights may make formal regulation increasingly difficult.<sup>134</sup>

*B. Will the Market Take Care of Fuel Efficiency?*

There are two primary arguments that the types of regulations asked for in the petitions and potentially implemented by the EPA (if they so desired) may be wholly unnecessary. First, the airline industry is struggling mightily to stay afloat in light of record high fuel prices experienced in recent years.<sup>135</sup> This will make improved fuel efficiency an absolute necessity for the industry to survive.<sup>136</sup> While reducing costs and not emissions may be the goal of airline industry behavior, investing in the very same fuel efficient technology and adopting the operational fuel saving measures may be forced by the market as a matter of survival. This is a case where intent is inconsequential; the end result, a reduction in GHG emissions, is essentially all that matters.

Second, the prevailing thought is that any sort of new federal regulation or eventual international agreement will take the form of a cap-and-trade based emissions trading system.<sup>137</sup> A cap-and-trade system is described simply as a system that allows a total maximum amount of emissions for a specific region, a "cap," and then allows the individual regions to trade amongst themselves to

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<sup>133</sup> Int'l Civil Aviation Org., Conference on Aviation and Alternative Fuels, <http://www.icao.int/waaf2009/>.

<sup>134</sup> Statement from the International Civil Aviation Organization (ICAO) to the Twenty-Seventh Session of the UNFCCC Subsidiary Body for Scientific and Technological Advice (SBSTA) (Dec. 11, 2007), available at <http://www.icao.int/env/sbsta-27.pdf>.

<sup>135</sup> *Buckle up: Trouble Ahead for the World's Airlines*, THE ECONOMIST, June 3, 2008, [http://www.economist.com/business/displaystory.cfm?story\\_id=11484142](http://www.economist.com/business/displaystory.cfm?story_id=11484142), see also Chris Reiter and Kyle Peterson, *Trouble on the Horizon for U.S. Airlines*, Reuters, Dec. 3, 2007, <http://www.reuters.com/article/AerospaceandDefense07/idUSN302715252http0071203>; see also Energy Information Administration, [http://www.eia.doe.gov/emeu/stco/pub/fsheets/real\\_prices.html](http://www.eia.doe.gov/emeu/stco/pub/fsheets/real_prices.html).

<sup>136</sup> *Id.*

<sup>137</sup> See Obama, *supra* note 15; see also Kyoto, *supra* note 3; see generally Flatt, *supra* note 47, for a description of the legislative options on the table in the U.S. that are predominantly cap and trade oriented.

meet the requirements.<sup>138</sup> If one region is below its cap it can sell its excess to a region that is above its cap.<sup>139</sup> Any market-based cap-and-trade program would put a premium on reducing emissions.<sup>140</sup> If an industry could obtain extremely valuable carbon credits in such a market simply by changing its runway practices or investing in new fuel-efficient technology, it would certainly be in its economic best interest to do so.<sup>141</sup> The ICAO has researched the effect of such a market on the aviation industry and has encouraged states to adopt measures to facilitate one.<sup>142</sup> They state:

One of the principal findings is that an emissions-trading system that is, is a system whereby the total amount of emissions is capped and allowances, in the form of permits to emit CO<sub>2</sub>, can be bought and sold to meet emission reduction objectives. Such a system could serve as a cost-effective measure to limit or reduce CO<sub>2</sub> emitted by civil aviation in the long term, provided that it is open to all economic sectors.<sup>143</sup>

There appears to be an underlying belief that market forces, whether they be in the form of an established cap-and-trade regime or simply the airline's efforts to cut costs, may make direct regulation of the airline industry on their emissions of GHGs unnecessary or ineffective.

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<sup>138</sup> For a general overview of emissions trading see AN EMERGING MARKET FOR THE ENVIRONMENT: A GUIDE TO EMISSIONS TRADING; UNITED NATIONS ENVIRONMENT PROGRAMME

Division of Technology, Industry and Economics (2002). The economic benefit of allowing trading is seen through the following example: "Consider two companies, A and B, both of which emit significant quantities of a given pollutant. Their emissions may damage air quality, and the relevant authorities may decide that emissions should be reduced by a given amount, say by 10 per cent. At first glance, the solution seems simple: both A and B cut their emissions by 10 per cent. But in the real world, this may impose very different burdens on the two companies. For example, company A may, by the nature of its activities, be able to reduce its emissions by 10 per cent or even more at relatively low cost. Company B, on the other hand, may find this a difficult and costly process. It is this potential difference in reduction cost between A and B that creates a market opportunity." *Id.* at 4.

<sup>139</sup> *Id.*

<sup>140</sup> *Id.*

<sup>141</sup> *Id.*

<sup>142</sup> Int'l Civil Aviation Org., Resolutions Adopted by the Assembly, Sept. 18-27, 2007 (Montreal, CA), [http://www.icao.int/icao/en/env/A36\\_Res22\\_Prov.pdf](http://www.icao.int/icao/en/env/A36_Res22_Prov.pdf) at Appendix L.

<sup>143</sup> ICAO, *supra* note 19.

## VII. Conclusion

The petitions filed requesting that the EPA regulate GHG emissions from aircraft engines do not appear able to force the result they desire. However, if the EPA decides to pursue the requested provisions voluntarily, Section 231 of the CAA may provide some authority to do so. It is unclear that the EPA would have authority to establish fuel conservation operational standards. Section 231 limits the EPA's authority to regulate "aircraft engines" rather than the entire aircraft, although the legislative history looks at the engine as a complete system. All previous regulations under both Section 231 and Section 202 have been technology-based and are not analogous to the operational procedures proposed. In addition, the legislative history suggests that Congress intended to test the emission standards during the engine certification process, something that could not be done with the operational standards suggested. Finally, the existence of Section 108 may indicate that Congress intended such standards to be implemented under the non-binding provisions of Section 108, not made mandatory using Section 231.

Although the EPA is given great deference in interpreting the statute, it has yet to list GHGs as criteria pollutants. There appears to be more authority given to the EPA to regulate GHG aircraft emissions through fuel efficiency standards established during engine production. The Court has ruled that the EPA has this authority in the case of motor vehicles.<sup>144</sup> However, differences in the language of the statutes may be at issue. The EPA has also acknowledged that technology forcing fuel efficiency standards are an adequate solution to the GHG emission problems presented by motor vehicles,<sup>145</sup> and in the recent ANPR alluded that it has the authority, although not the requirement, to do so with aircraft engines.<sup>146</sup>

Traditional technology-based approaches do not adequately exist to properly regulate GHG emissions from aircraft. Given the history of Section 231 and other similar provisions, it may be best to focus Section 231 efforts on fuel efficiency and fuel burn reduction strategies in engine and aircraft production. Fuel

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<sup>144</sup> Mass., 549 U.S. at 534.

<sup>145</sup> See National Solution, *supra* note 18.

<sup>146</sup> ANPR, *supra* note 16, at 215.



conservation operational standards, which appear less implementable under Section 231, may be best utilized as emission reduction guidance programs under Section 108 of the CAA. Finally, it may be the case that the market will force these fuel reduction strategies before the courts or new regulations can. The possibility of the U.S. entering a cap and trade GHG market now appears highly likely; in such a market any achievable reductions will become a valuable commodity for the struggling airline industry.<sup>147</sup>

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<sup>147</sup> See Buckle Up, *supra* note 135; see also Reiter, *supra* note 135.

